

Building America 2001

The Hickory Consortium

Update &

Integration Planning Workshop

April 10th, 2001



The Hickory Consortium

Who we are:

Sustainable Housing

Whole Building Process

Urban

Systems Built

Energy & Environmental Quality



Background



- High performance buildings
- Low performance industry



Systems Focus

Process modeling to find leverage points

Create or shorten Feedback loops

It's the Feedback loop



Strategy

- Quality Modular Building Task Force
- Partnering
- Feedback from/to Industry
- •More R&D
- •Finish the loop



Some Hickory Projects

- •Elm Street complete
- •1008 -complete
- Cambridge Co-housing-complete
- •Erie Ellington-complete
- •Cambridge Park Place under construction
- •Franklin St.-planning
- •Modular model homes planning



Some Success Stories

- •Solar preheat at 1008
- •Heating systems ground source heat pump
- •Infiltration Control
- •Building one unit early and testing at CPP
- •Leverage through Green Building Council
- Publicity



Ecodynamics_{TM}

Building Affordably Building Green

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"The Meek shall inherit the Earth..."

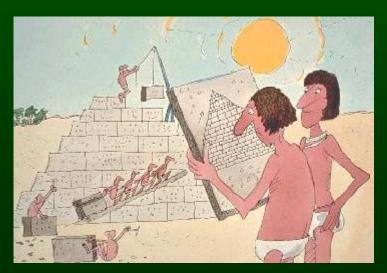
- Why Green?
- Who's Green?
- How Green?





Tautology for Today

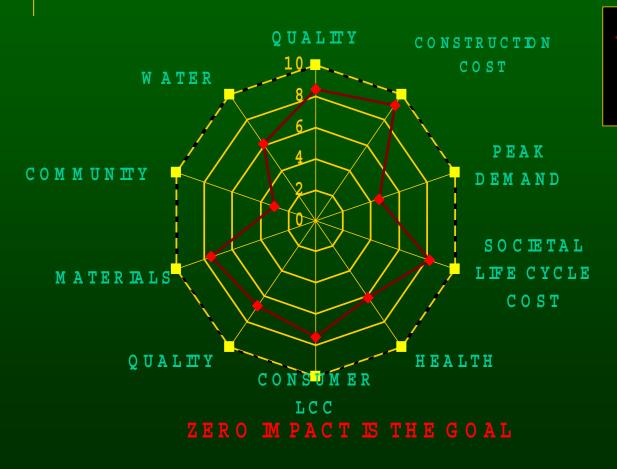
If it's not affordable, it's not sustainable
If it's not sustainable, it's not affordable





SUSTAINABILITY TARGET:

ECODYNAMIC PROTOTYPE RATING RESULTS



ECODYNAM IC

BASE CASE



Why Green?

QuickTimeTM and a Photo CD Decompressor Are needed to use this picture



Erie-Ellington Homes Project

A new paradigm for low-income housing



Hickory Consortium/ GreenVillage Company



The Neighborhood

- Close to trolley/Zoo
- Derelict/attractive
- Community values







- Two and Three Family
- Sites need low level remediation







The Project





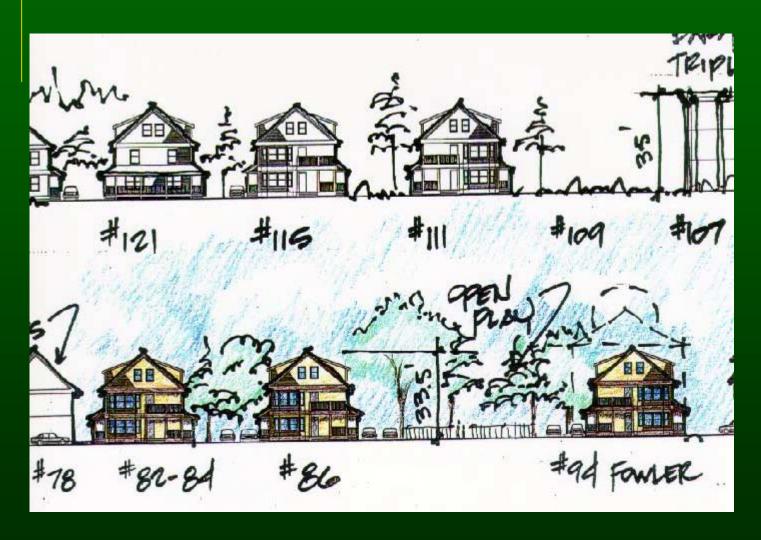
How Green?

EcoDynamic Specifications Whole Building Approach

- Reduced energy use
- Reduced water use
- High quality ventilation /IAQ
- Green building materials
- Reduced costs through design and construction
- Partnering process



Community in Context





Materials and Methods

QuickTimeTM and a Photo CD Decompressor Are needed to use this picture



Know How?

QuickTimeTM and a Photo CD Decompressor Are needed to use this picture

R-100 average insulation



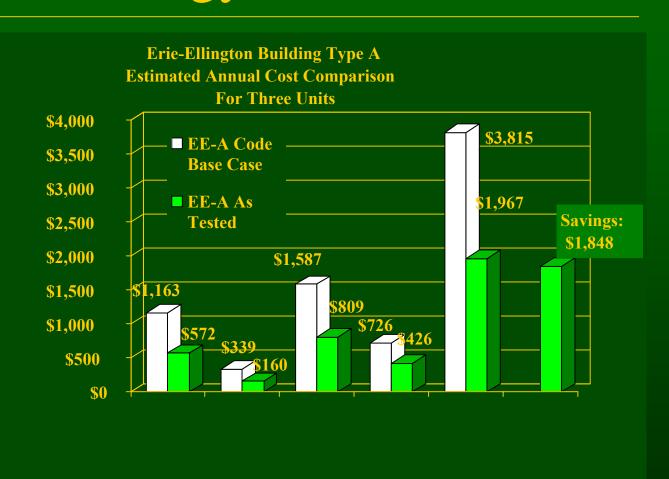
Know How?



Performing Specifications



49% Energy Reduction





Methodology



- Partnering is not a crunchy granola concept!!
- Document it right.
- Performance specs
- Contract it right.
 - What did the owner buy?
 - Who knows that?
- Walk the walk



Who's Green?

- Department of Energy (BA)
- City of Boston (DND)
- •Commonwealth of Ma (DHCD)
- •Codman Square NDC
- •CWC/Thomas Builders
- Conservation Services Group
- •EPA
 - •\$250 for a refrigerator
 - •\$150 for a dishwasher
 - •\$20 per high efficiency lighting fixture
 - •\$400 for high efficiency boiler (from Boston Gas)
 - •\$50 per thermostat
 - •Window rebate(\$250 to \$350 per bldg)
 - •Energy Star rebate for whole house(\$500 to \$900 per bldg)
 - •Total= \$65000





Devalue Engineering

- Prioritize your goals
- Know the true costs
- Educate your clients
- Be able to compare apples and oranges
 - When is a dollar not a dollar?
 - Pella Windows vs. vinyl baseboard???





Performance Specifications

- Summary of Work 01010
 - Innovations:
 - Performance standards set requiring blower door test
 - "Heatmaker" boiler due to lower energy required
 - Indoor Air Quality maintained thru Airtrak controls
 - Low-flow fixtures for plumbing
 - STC ratings documented
- Division 1 Section 01300
 - Submittals
 - Schedule of Values includes :
 - » CPM schedule update each month
 - » Shop drawings
 - » Water tests, sprinkler tests, blower door tests
- Division 7 Sealants
 - Joint Sealants
 - Max. 1.5 sq.in. per 100 sq.ft. air leakage at 4 pa.
 - Provide air quality control to meet ASHRAE 62-89
 - Provide ventilation equal to 20 CFM continuous up to 90
- Division 15 Plumbing/ Fire Protection/ Heating and Ventilating
 - Summary of Work
 - Seal all penetrations in vapor barrier, exterior walls, party walls....
- Division 16 Electrical
 - Summary of Work
 - Seal all holes in exterior walls....



Closing the Circle



- 50% Boston Jobs
- 25% minority run business
- 10% women run business

- Break the cycle of absentee landlords
- End the poor quality
- Stop the environmentally irresponsible



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- •What made it affordable?
 - •Whole Building design
 - Repetition
 - •Scale
 - •Systems Engineering
 - Materials
 - •Rebates

•What made it sustainable?

- •Energy efficiency
- •Green materials
- Partnering
- Community



Getting the word out

- Outreach and General Education
- Professional Education and Mentoring
- Marketing for Project Development



Recent outreach

- NESEA Conference Presentations and Award
- Green Prints Presentations in Atlanta, NAHB in Seattle
- Developers Roundtable on Green Building –
 CDC Initiative
- Fine Home Building web feature and upcoming article
- HC Newsletter, publications, and media coverage



Systems Built - Lessons Learned

- Factory components better than expected
- Site installation worse and can exaggerate problem endemic
- Quality at or below average for finished product
- Energy must be planned in from beginning
- Quality can be free if it is part of the process
- Builders want to do a good job if it easy and safe



Concentration on Site Installation

- Kaisen for site builder
- Industrial engineering on site studies
- Rubric for builder/developer
- System Dynamics model of site process
- Modular Energy Star manual



Technical Work

- Multi-Air
- Ventilation Overview of BA technology
- Modular home run system builds on Multi-Air
- Systems Integration combo units for heat/DHW
- Modular air sealing techniques



Leveraging Success

- Process improvement: in factory
- Systems engineering in Design
- Product support in factory
- Leveraging through LEED
- Hickory providing Energy star certification where NA
- Rubric for site process improvements
- Partnering process on site
- PR of success so others will copy



Conclusions and Opportunities

- Making tests permanent- stickiness of change
- Product design needed for small companies
- Control systems more sophistication needed at the bubble thermostat cost
- After sale product support warranties and field service